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The Official Action of October 10, 2001 has been thoroughly studied. Accordingly, the changes presented herein for the application, considered together with the following remarks, are believed to be sufficient to place the application into condition for allowance.

Together with the present Amendment, applicant is submitting a Substitute Specification under the provisions of 37 CFR §1.125(b) together with a marked-up copy of the original specification which shows the additions and deletions made to the Substitute Specification. In accordance with the provisions of 37 CFR §1.125(b), the undersign states that no new matter has been added into the Substitute Specification.

The Substitute Specification is being submitted in order to incorporate changes which are made in response to the Examiner's request on page 2 of the Official Action that applicant review and revise the specification.

By the present amendment, claims 1-6 have been amended to incorporate the changes that were courteously suggested by the Examiner on pages 2 and 3 of the Official Action.

Also by the present amendment, the Abstract of the disclosure has been rewritten in response to the Examiner's objection thereto.

In response to the objection to the drawings, applicant is submitting herewith under separate cover a Request for Approval of Drawing Amendments to which is attached photocopies of Figs 1 and 2 with proposed changes indicated in red ink.

Entry of the Substitute Specification together with the changes to the claims, Abstract and drawings is respectfully requested.

On page 2 of the Official Action the Examiner requested applicant to review and revise the specification to address "unclear, inexact or verbose terms" and to comply with the requirements of terms that are "clear, concise and exact."

In response, as noted above, applicant is submitting herewith a Substitute Specification under the provisions of 37 CFR §1.125(b).

The Substitute Specification is believed to address and overcome the objections to the original specification without adding any new matter thereto.

The Examiner had objected to the Abstract of the disclosure as being too short. In response to this objection, applicants have rewritten the Abstract to be longer and to overcome the objections thereto which are set forth in the first paragraph on page 2 of the Official Action.

The drawings stand objected to for not including lines from each reference numeral to the structure it denotes. Also the Examiner indicated that reference numeral 13 should either not be shown in Fig. 2, or if shown, it should be consistent. The Examiner has also indicated that reference numeral 19 appears to denote structure that is also designated 31.

As noted above, applicant is submitting herewith under separate cover a Request for Approval of Drawing Amendments to which is attached photocopies of Figs. 1 and 2 with proposed changes indicated in red ink. The proposed drawing amendments are believed to address the drawing objection set forth by the Examiner.

It is noted that reference numeral 19 designates the elastic members that extend circumferentially of the leg-holes and reference numeral 31 designates the elastic members that are associated with the waist-hole.

The disclosure stands objected to because reference numeral 28, shown in Fig. 2 was not discussed in the specification. In response to this objection, reference numeral 28, which was not needed for disclosure purposes, has been deleted from Fig. 2.

The Examiner has objected to the specification on the basis that claim 6 was broader than the disclosure. This objection has been addressed by amending claim 6 herein to recite that the stretch stress of the covering zone is higher than the stretch stress of the elastic zone when the elastic zone is stretched by 3-20%.

As noted above, the claims have been carefully amended to incorporate the changes courteously suggested by the Examiner in the paragraph bridging pages 2-3 of the Official Action.

Claims 1-7 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite. Under this rejection the Examiner has raised a number of issues that are believed to be addressed and overcome by the amendments made herein to the claims.

Claims 1-6 and 8 are pending in this application.

Claims 1-7 were rejected under 35 U.S.C. §102(b) as being anticipated by European Patent Application No. 0 688 550 A1 to Kimberly-Clark Corp. ("EP '550").

For the reasons set forth below, it is submitted that each of the pending claims are allowable over EP '550 and therefore, the outstanding rejection of the claims based upon this reference should proper be withdrawn.

Favorable reconsideration by the Examiner is respectfully requested.

The Examiner has referred to the figures of EP '550 together with passages at page 2, line 53 *et seq.*, page 5, line 43 through page 6, line 10, and page 6, lines 8-48.

In the last sentence on page 3 of the Official Action the Examiner has stated:

It is noted that the covering area as claimed need not encompass the entire circumferential direction, i.e. "full length of the edge zone."

As apparently conceded by the Examiner, EP '550 does not teach a cover layer which } No
encompasses the "full length of the edge zone."

In contrast, as shown in applicant's Fig. 2, and claimed, applicant's invention requires

...a covering zone formed integrally with said crotch region and a continuously elastic zone extending along a full length in a circumferential direction of at least one of said front and rear waist regions...

The front and rear covering zones are depicted as areas 21 and 22 in Fig. 2 and the front and rear elastic zones are depicted as areas 18A and 18B in Fig. 2.

Applicant's claimed invention further requires a

...second member being inelastically stretchable to a length greater than the transverse length of said covering zone and attached to an upper edge of said covering zone.

EP '550 does not teach the limitations of applicant's claimed second member.

In EP '550 the waistborder sections include elastic and non-elastic portions and the waistband is disclosed as being elastic.

Accordingly, EP '550 fails to teach the structure of applicant's claimed invention and therefore cannot be relied upon as anticipating the pending claims.

Based upon the above distinctions between EP '550 and the present invention, and the overall teachings of EP '550, properly considered as a whole, it is respectfully submitted that the Examiner cannot rely upon EP '550 as required under 35 U.S.C. §102 as anticipating applicant's claimed invention.

It is, therefore, submitted that any reliance upon EP '550 would be improper inasmuch as EP '550 does not remotely anticipate, teach, suggest or render obvious the present invention.

It is submitted that the claims, as now amended, and the discussion contained herein clearly show that the claimed invention is novel and neither anticipated nor obvious over the teachings of EP '550 and the outstanding rejection of the claims should hence be withdrawn.

Therefore, reconsideration and withdrawal of the outstanding rejection of the claims and an early allowance of the claims is believed to be in order.


It is believed that the above represents a complete response to the Official Action and reconsideration is requested.

The prior art made of record on page 4 of the Official Action has been reviewed but is not deemed to be particularly relevant to applicant's invention.

If upon consideration of the above, the Examiner should feel that there remains outstanding issues in the present application that could be resolved, the Examiner is invited to contact applicant's patent counsel at the telephone number given below to discuss such issues.

To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 02-0385 and please credit any excess fees to such deposit account.

Respectfully submitted,


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MARKED-UP COPY OF SUBSTITUTE SPECIFICATION

DISPOSABLE DIAPER

BACKGROUND OF THE INVENTION

This invention relates to a disposable diaper absorbing and containing body wastes.

Disposable diapers utilizing an inelastic or non-stretchable sheet as [its] their topsheet and/or backsheet [is] are well known. It is also well know in such diapers to secure elastic members under tension in circumferential directions along leg-holes and a waist-hole, respectively, to the inner surface of the topsheet and/or the backsheet and thereby to ensure a good fit of the leg-holes and the waist-hole to the wearer's skin.

pm 5-7-02 In the case of such a well known diaper, a waist size of the diaper has sometimes been dimensioned to be substantially larger than an average waist size of the wearer particularly when the diaper is of the pull-on type so that the diaper may be easily put on the wearer's body with the waist-hole being adequately opened. This is true for the leg-holes. However, such dimensioning has necessarily required an amount of cloth that is much more than a sufficient amount of cloth needed to cover the wearer's legs and waist.

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SUMMARY OF THE INVENTION

It is an object of this invention to provide a disposable diaper [improved] that is designed to be easily put on [the] a wearer's body without excessive consumption of cloth.

According to this invention, there is provided a disposable diaper having front and rear waist regions and a crotch region extending therebetween, the diaper comprising at least one of the front and rear waist regions having an edge zone extending in a circumferential direction around a waist-hole being elastic over a full length of the edge, wherein:

the waist region comprises a covering zone formed integrally with the crotch region to position a waist region of the wearer and an elastic zone attached along an upper edge of the covering zone and adapted to be elastically stretchable in the circumferential direction and the elastic zone comprises a first member adapted to be elastically stretchable in the circumferential direction to a length beyond a length of the covering zone and a second member covering the first member, the second member being adapted to be inelastically stretchable to a length beyond the length of the covering zone and to be attached to the upper edge of the covering zone.

The disposable diaper according to this invention enables the elastic zones associated with the waist-hole to be stretched to a length substantially larger than a total length of the [the] edges of the covering zones and thereby to open the waist-hole sufficiently to ensure that the diaper can be easily put on [the] a wearer's body, even when the covering zones of the front and rear waist regions have no stretchability in the circumferential direction. With the diaper, it is unnecessary to dimension a circumferential dimension of the covering zones to be substantially larger than a circumferential dimension of the wearer's torso and therefore stock material required to make the diaper can be correspondingly reduced. Particularly when the rubber ribbon constituting the elastic zone is covered with [the] a non-stretchable sheet previously formed with gathers, it is unnecessary to cover the rubber ribbon with [the] a relatively expensive stretchable sheet.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a partially cutaway perspective view showing a diaper according to a principle of this invention; and

Fig. 2 is a partially cutaway perspective view showing the diaper developed longitudinally thereof.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A disposable diaper according to this invention will be described in more [details] detail with reference to the accompanying drawings.

[A] The disposable diaper 1 shown [by] in Fig. 1 in a partially cutaway perspective view is of the pull-on or shorts-type and has a front waist region 6, a rear waist region 7 and a crotch region 8 extending between these two waist regions 6, 7. The front and rear waist regions 6, 7 are put flat together along their respective pairs of transversely opposite side edges 11, 12 and joined together at joining spots 13 arranged along the side edges 11, 12 intermittently in a vertical direction as viewed in Fig. 1 so as to form a waist-hole 16 and a pair of leg-holes 17. An elastic member 18 extends circumferentially around the waist-hole 16 and elastic members 19 extend circumferentially around respective the leg-holes 17. The diaper 1 comprises a liquid-pervious topsheet 2 defining the inner side of the diaper 1, a liquid-impervious backsheet 3 defining the outer side of the diaper 1 and a liquid-absorbent core 4 disposed between the topsheet 2 and the backsheet 3.

Fig. 2 is a partially cutaway perspective view of the diaper of Fig. 1 cut open along the joining spots 13 and having its front and rear waist regions 6, 7 developed apart in a direction of double-headed arrow A in Fig. 1. The front and rear waist regions 6, 7 respectively comprise front and rear covering zones 21, 22 adapted to cover front and rear waist regions of the wearer and front and rear elastic zones 18A, 18B identical in shape as well as in size provided along front and rear ends 23, 24 of the respective covering zones 21, 22 extending circumferentially

along the waist-hole 16. The crotch region 8 comprises a crotch covering zone 26 adapted to cover a crotch region of the wearer and a pair of elastic zones 19 provided along curved edges 27 of the covering zone 26. The front and rear covering zones 21, 22 and the crotch covering zone 26 are formed by the topsheet 2, the backsheet 3 and the core 4 which are continuous longitudinally of the diaper 1. The core 4 is hourglass-shaped and portions of the topsheet 2 and the backsheets 3 extending outward beyond a peripheral edge of the core 4 are put flat and joined together by means of hot melt adhesive agent (not shown).

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5-702* The diaper 1 is assembled by putting the transversely opposite side edges 11, 12 of the front and rear waist regions 6, 7 flat together, then joining them together at the joining spots 13 and thereby an annular elastic zone 18 is formed by the front and rear elastic zones 18A, 18B. Of the front and rear elastic zones 18A, 18B, the rear elastic zone 18B is illustrated [as] in a state before [this] elastic zone 18B is attached to the rear covering zone 22. The rear elastic zone 18B comprises a rubber ribbon 31 which can be elastically stretched by at least 1.3 times, preferably by 2.0 times, more preferably by at least 3.0 times of a length L of the rear waist region 7 and a covering sheet 32 adapted to cover the rubber ribbon 31, which covering sheet 32 is longer than the dimension L and stretchable at least at the stretchability of the rubber ribbon 31. The number of the rubber [ribbon] ribbons 31 and their shape as well as the dimension of [its] their cross-section are not specified. Raw material for the rubber ribbon 31 also is not specified and may be selected from a group including natural rubber, synthetic rubber, synthetic resin elastomer, synthetic resin elastic threads and a woven fabric made of such elastic threads. However, it is important that the front and rear elastic zones 18A, 18B each comprising an assembly of the rubber ribbon 31 and the covering sheet 32 should have their circumferential stretch stress

preferably when they are stretched by 3 ~ 20% lower than a stretch stress exhibited by portions of the front and rear covering zones 21, 22 extending along the elastic zones 18A, 18B having the same widths as the elastic zones 18A, 18B. Generally, the covering sheet 32 is longer than the dimension L and inelastically or elastically stretched as the rubber ribbon 31 is elastically stretched. For example, a non-stretchable sheet longer than the dimension L is formed with gathers 33 undulating in the circumferential direction along the waist-hole to make this sheet substantially stretchable and this covering sheet 32 is attached to the rear covering zone 22. Alternatively, the covering sheet 32 can comprise an inelastically stretchable sheet attached to the rear covering zone 22 so that the sheet may be stretched as the rubber ribbon 31 is stretched and [forms] form gathers as the rubber ribbon 31 contracts. It is also possible to use [the] a covering sheet 32 that is adapted to be elastically stretched together with the rubber ribbon 31.

The rubber ribbon 31 may be covered with a pair of covering sheets 32 in a sandwich fashion or covered with [the] a covering sheet 32 that is cylindrically shaped and adapted to receive the rubber ribbon 31 therein. In any case, the rubber ribbon 31 is secured to the covering sheet(s) 32 [sheet] at least at longitudinally opposite ends of the rubber ribbon 31 or, if desired, a length of the rubber ribbon 31 defined between the opposite ends is intermittently or continuously bonded to the covering sheet(s) [sheet] 32. [Specifically to describe in reference with] In a specific embodiment shown in Fig. 2, three to five pieces of synthetic rubber ribbon 31 each having a thickness of 0.3 mm, a width of 2.1 mm and a length of 171 mm are stretched to 400 mm and intermittently bonded to a pair of [the] non-stretchable covering sheets 32 made of a spun bond nonwoven fabric and having a length of 400 mm by means of a hot melt adhesive agent (not shown) so as to cover the rubber [ribbon] ribbons 31 with the covering [sheet] sheets

32 in sandwich fashion and thereby to obtain the rear elastic zone 18B. The rubber [ribbon] ribbons 31 [is] are relaxed so as to contract and thereby [causes] cause the [sheet] cover sheets 32 to form [the] gathers 33. The rear elastic zone 18B contracted to a length of 240 mm in this manner is attached to the rear covering zone 22 having the length L of 240 mm as measured along the waist line by suitable means such as adhesion, heat-sealing or stitching.

With the diaper 1, the elastic zone 18 associated with the waist-hole 16 is stretched as indicated by the imaginary lines in Fig. 1 and said waist-hole 16 is adequately opened so that the diaper 1 can be easily put on [the] a wearer's body even when the front and rear covering zones 21, 22 have no stretchability in the circumferential direction.

With this diaper 1, [similarly] in a manner similar to the elastic zone 18 associated with the waist-hole 16, each of the elastic zones 19 associated with the leg-holes 17 should be elastically stretchable to a dimension longer than, at least by 1.3 times, preferably at least by 2 times and more preferably at least by 3 times of an actual dimension as measured along the length surrounding edge 27 of the crotch covering zone 26. Such elastic zone 19 may comprise elastically stretchable rubber ribbon and a stretchable covering sheet.

As will be apparent from the foregoing description made [in] with reference [with] to the accompanying drawings, either both the longitudinal ends of the front and rear waist regions 6, 7 or any one of these ends may be provided with an elastic stretchability in accordance with this invention. It is possible without departing from the scope of this invention to adjust the stretch stresses of the elastic zones 18A, 18B associated with the front and rear waist regions 6, 7 to be different from each other. [The well] Well known stock materials may be used to form the

topsheet 2 and the backsheet 3 and the core 4. Bonding of the respective members may be performed using suitable means such as adhesion, heat-sealing or stitching.

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Marked-Up Copy of the Claims
As Amended on February 11, 2002

1. (Amended) A disposable diaper having a front waist region, a rear waist region and a crotch region, and a waist hole and a pair of leg-holes, said diaper further comprising: [extending therebetween, said diaper comprising at least one of said front and rear waist regions having an edge zone thereof extending in a circumferential direction provided along a full length of said edge zone with an elastic stretchability, wherein:]

[said waist region comprises] at least one of said front and rear waist regions including a covering zone formed integrally with said crotch region and an elastic zone extending continuously along a full length in a circumferential direction of said at least one of said front and rear waist regions to define at least part of said waist-hole; [to cover said waist region of diaper wearer and an elastic zone attached along an upper edge of said covering zone and adapted to be elastically stretchable in said circumferential direction; and]

said elastic zone [comprises] including a first member [adapted to be] that is elastically stretchable in said circumferential direction of said at least one of said front and rear waist regions to a length [beyond a] greater than a transverse length of said covering zone and a second member covering said first [member,] member; and

said second member being [adapted to be] inelastically stretchable to a length [beyond] greater than the transverse [said] length of said covering zone and [to be] attached to [said] an upper edge of said covering zone.

2. (Amended) The diaper according to Claim 1, wherein said first member comprises at least one [a] rubber ribbon.

3. (Amended) The diaper according to Claim 1, wherein said second member comprises a sheet material having an initial length greater than [beyond] the length of said covering zone in said circumferential direction of said at least one of said front and rear waist regions and formed in said circumferential direction with gathers in order to shorten said sheet material substantially to said length of said covering zone.

4. (Amended) The diaper according to Claim 1, wherein said second member comprises a sheet material having a length substantially equal to the length of said covering zone in said circumferential direction of said at least one of said front and rear waist regions and [adapted to be] inelastically stretchable in said circumferential direction.

5. (Amended) The diaper according to Claim 1, wherein said covering zone is non-stretchable in said circumferential [direction.] direction of said at least one of said front and rear waist regions.

6. (Amended) The diaper according to Claim 1, wherein said covering zone is elastically stretchable in said circumferential direction and has a stretch stress higher than a stretch stress of

said elastic zone when said elastic zone is stretched by 3-20% in a portion of said covering zone extending along said elastic zone and having a same width as said elastic zone.

Claim 7 was canceled without prejudice or disclaimer.

The following new claim 8 was added:

--8. The diaper according to Claim 1, wherein each of said leg-holes comprises a covering zone integrally with said crotch region and a continuously elastic zone extending along a full length in a circumferential of each of said leg-holes, said elastic zone including a third member that is elastically stretchable in said circumferential direction of each of said leg-holes and a fourth member securing and covering said third member, said fourth member being inelastically stretchable to a length greater than said length of the length in said circumferential direction of each of said leg-holes and joined to an outer side edge of each of said leg-holes.--